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Job No.: CTCE/BBMP/W.No.07/AGNS/WMM/Gradation/2015-16 06.06.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.

Agency : **Mr. A.G. Narayanaswamy,**
#13, Venkateshwara Layout, Horamavu, Bangalore - 43.

Name of Work : Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.

Reference : AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015

Date of Testing : 06.06.2015

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **26050**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	990	990	3.8	96.2	95-100
22.4	5490	6480	24.9	75.1	60-80
11.2	5240	11720	45.0	55.0	40-60
4.75	4985	16705	64.1	35.9	25-40
2.36	3625	20330	78.0	22.0	15-30
0.600	2215	22545	86.5	13.5	8-22
0.075	2255	24800	95.2	4.8	0-8

A2-7

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

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Job No.: CTCE/BBMP/W.No.07/AGNS/WMM/AIV/2015-16 06.06.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	06.06.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	300	
4	Aggregate Impact value = percent fines	21.32	21.47	
	100* (W_2/W_1)%			21.48

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.07/AGNS/WMM/S-T/2015-16 06.06.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	06.06.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.32%**

Elongation Index = **13.85%**

Result : Combined Flakiness & Elongation index **26.17%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

AE-T

Note:

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T-2377

Job No.: CTCE/BBMP/W.No.07/AGNS/CSR-6/856/QB(SDBC)/2015-16 22.06.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
*NAME OF THE WORK	:	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
SAMPLE ID	:	Bitumen
SAMPLE RECEIVED ON	:	16.06.2015
PERIOD OF TESTING	:	16.06.2015 to 22.06.2015

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2006
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	86	80 to 100
2	Softening point, °C	IS :1205 -1978 (RA-2009)	46	Min. 40
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	286	Min. 220

*Information is furnished by the Customer/Representative.

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VISHWANATH. I.A.
Chief Executive Officer

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com
E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/AIV/2015-16 23.06.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.06.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	388	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	84.5	300	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.68	22.88	22.34

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.06.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	379	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	84.5	300	
4	Aggregate Impact value = percent fines $100^* (W_2/W_1)\%$	20.63	20.84	20.98

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/AIV/2015-16 23.06.2015

Aggregate Impact Value

IS: 2386 Part IV

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Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.06.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	81	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	84.5	302	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	21.32	21.35	21.37

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/AIV/2015-16 23.06.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
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Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.06.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	377	378	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	77	78	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	84.5	300	
4	Aggregate Impact value = percent fines $100^* (W_2/W_1)\%$	20.42	20.63	20.84

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Shape_T/2015-16 : 23.06.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of Work	: Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	: AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.06.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **11.93%**

Elongation Index = **13.22%**

Result : Combined Flakiness & Elongation index **25.15%**

Comments:

Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

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NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Shape_T/2015-16 : 23.06.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
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Reference	: AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.06.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.35%**

Elongation Index = **13.12%**

Result : Combined Flakiness & Elongation index **25.47%**

Comments:

Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Shape_T/2015-16 : 23.06.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

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Reference	: AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.06.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.32%**

Elongation Index = **13.12%**

Result : Combined Flakiness & Elongation index **25.44%**

Comments:

Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Shape_T/2015-16 : 23.06.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	: **Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
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Reference	: AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.06.2015

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **11.85%**

Elongation Index = **13.58%**

Result : Combined Flakiness & Elongation index **25.43%**

Comments:

Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Stripping/2015-16 23.06.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.06.2015

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.3	3.20	96.80
2	3.1		
3	3.2		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/SDBC/Sp_Wa/2015-16 23.06.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	23.06.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2024	2025	2026	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1269	1270	1271	
4	Weight of saturated surface dry aggregate in air	W_3 g	2014	2015	2016	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	745	745	745	
6	Weight of oven dried aggregate	W_4 g	2000	2001	2002	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.685	2.686	2.687	2.686
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.736	2.737	2.739	2.737
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.70%	0.70%	0.70%	0.70%

AE-1

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Bit/2015-16 25.06.2015

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
NAME OF THE WORK	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
SAMPLE I/D	Roads in Jakkur Layout Ward No.07.
DATE OF TESTING	25.06.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474.5	474.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25.5	25.50
7. Bitumen content in %	5.10	5.10
8. Average	**5.10**	

Note:

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Bit/2015-16 25.06.2015

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
NAME OF THE WORK	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
SAMPLE I/D	Roads in Jakkur Layout Ward No.07.
DATE OF TESTING	25.06.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.22	5.32	5.32	94.68	90-100
4.75	258.5	54.48	59.79	40.21	35-51
2.36	52.32	11.03	70.82	29.18	24-39
1.18	40.22	8.48	79.30	20.70	15-30
0.3	36.23	7.64	86.93	13.07	9-19
0.075	28.52	6.01	92.94	7.06	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	32.12	6.77	6.77	93.23	90-100
4.75	260.5	54.90	61.67	38.33	35-51
2.36	52.32	11.03	72.70	27.30	24-39
1.18	41.22	8.69	81.38	18.62	15-30
0.3	30.21	6.37	87.75	12.25	9-19
0.075	28.53	6.01	93.76	6.24	3-8

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Bit/2015-16 26.06.2015

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
NAME OF THE WORK	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
SAMPLE I/D	Roads in Jakkur Layout Ward No.07.
DATE OF TESTING	26.06.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475.5	474.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24.5	25.50
7. Bitumen content in %	4.90	5.10
8. Average	**5.00**	

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BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
NAME OF THE WORK	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
SAMPLE I/D	Roads in Jakkur Layout Ward No.07.
DATE OF TESTING	26.06.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	24.56	5.17	5.17	94.83	90-100
4.75	256.3	53.90	59.07	40.93	35-51
2.36	50.28	10.57	69.64	30.36	24-39
1.18	41.25	8.68	78.32	21.68	15-30
0.3	36.35	7.64	85.96	14.04	9-19
0.075	30.25	6.36	92.32	7.68	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	36.25	7.64	7.64	92.36	90-100
4.75	256.6	54.08	61.72	38.28	35-51
2.36	53.26	11.22	72.94	27.06	24-39
1.18	42.23	8.90	81.84	18.16	15-30
0.3	32.25	6.80	88.64	11.36	9-19
0.075	29.36	6.19	94.83	5.17	3-8

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/Bit/2015-16 27.06.2015

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
NAME OF THE WORK	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
SAMPLE I/D	Roads in Jakkur Layout Ward No.07.
DATE OF TESTING	27.06.2015

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	25.50
7. Bitumen content in %	5.00	5.10
8. Average	**5.05**	

AE-1

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BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
AGENCY	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
NAME OF THE WORK	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
REFERENCE	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
SAMPLE I/D	Roads in Jakkur Layout Ward No.07.
DATE OF TESTING	27.06.2015

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	26.36	5.55	5.55	94.45	90-100
4.75	250.6	52.76	58.31	41.69	35-51
2.36	55.63	11.71	70.02	29.98	24-39
1.18	45.26	9.53	79.55	20.45	15-30
0.3	38.52	8.11	87.66	12.34	9-19
0.075	36.65	7.72	95.37	4.63	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	39.65	8.36	8.36	91.64	90-100
4.75	259.6	54.71	63.07	36.93	35-51
2.36	50.26	10.59	73.66	26.34	24-39
1.18	43.25	9.11	82.77	17.23	15-30
0.3	31.25	6.59	89.36	10.64	9-19
0.075	30.25	6.38	95.73	4.27	3-8

AE-1

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/AGG/2015-16 25.06.2015

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	25.06.2015

Total Weight of Sample: **5250** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	435	8.3	8.29	91.71	90-100	
4.75	2655	50.6	58.86	41.14	35-51	
2.36	680	13.0	71.81	28.19	24-39	
1.18	480	9.1	80.95	19.05	15-30	
0.3	400	7.6	88.57	11.43	9-19	
0.075	350	6.7	95.24	4.76	3-8	

Total Weight of Sample: **5280** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	265	5.0	5.02	94.98	90-100	
4.75	2560	48.5	53.50	46.50	35-51	
2.36	820	15.5	69.03	30.97	24-39	
1.18	500	9.5	78.50	21.50	15-30	
0.3	430	8.1	86.65	13.35	9-19	
0.075	410	7.8	94.41	5.59	3-8	

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/AGG/2015-16 26.06.2015

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	26.06.2015

Total Weight of Sample: **5300** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	450	8.5	8.49	91.51	90-100	
4.75	2660	50.2	58.68	41.32	35-51	
2.36	700	13.2	71.89	28.11	24-39	
1.18	500	9.4	81.32	18.68	15-30	
0.3	385	7.3	88.58	11.42	9-19	
0.075	355	6.7	95.28	4.72	3-8	

Total Weight of Sample: **5350** gm

AE-1

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	285	5.3	5.33	94.67	90-100	
4.75	2550	47.7	52.99	47.01	35-51	
2.36	850	15.9	68.88	31.12	24-39	
1.18	535	10.0	78.88	21.12	15-30	
0.3	455	8.5	87.38	12.62	9-19	
0.075	420	7.9	95.23	4.77	3-8	

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Job No.: CTCE/BBMP/W.No.07/AGNS/SDBC/AGG/2015-16 27.06.2015

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** Kodigehalli Sub Division, BBMP, Bangalore.
Agency	**Mr. A.G. Narayanaswamy,** #13, Venkateshwara Layout, Horamavu, Bangalore - 43.
Name of the Work	Improvements of main roads and cross roads from 13th cross to 18th cross roads from 1st cross to 4th cross roads and drains in Jakkur Layout in Ward No.07, Kodigehalli Sub Division, BBMP, Bangalore.
Reference	AEE/(KOD.SUB.DIV)/70/2015-16 Dated: 03.06.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	27.06.2015

Total Weight of Sample: **5100** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	400	7.8	7.84	92.16	90-100	
4.75	2750	53.9	61.76	38.24	35-51	
2.36	650	12.7	74.51	25.49	24-39	
1.18	520	10.2	84.71	15.29	15-30	
0.3	258	5.1	89.76	10.24	9-19	
0.075	300	5.9	95.65	4.35	3-8	

Total Weight of Sample: **5200** gm

AE-1

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	255	4.9	4.90	95.10	90-100	
4.75	2600	50.0	54.90	45.10	35-51	
2.36	880	16.9	71.83	28.17	24-39	
1.18	545	10.5	82.31	17.69	15-30	
0.3	400	7.7	90.00	10.00	9-19	
0.075	300	5.8	95.77	4.23	3-8	

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